

REMARKS

The Office Action dated February 21, 2006, has been received and reviewed. Claims 26, 28-29, 32-34, and 36-37 have been amended. The pending claims are claims 1-39. Reconsideration and withdrawal of the rejections are respectfully requested.

Claim Amendments

Claims 26, 28-29, 32-34, and 36-37 were amended such that the term “first layer” was changed to the term “intermediate layer.” These amendments were made so that the amended claims are more consistent with the Description of the Invention. No new matter was added.

Abstract Amendments

The Abstract was amended such that the term “first layer” was changed to the term “intermediate layer.” These amendments were made so that the abstract is more consistent with the Description of the Invention. No new matter was added.

Specification Amendments

The Specification was amended as indicated above such that the term “first layer” was changed to the term “intermediate layer.” These amendments were made so that the Summary of the Invention is more consistent with the amended claims. No new matter was added.

The 35 U.S.C. § 112 Rejection

Claim 38 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention. Specifically, claim 38 was rejected because the element “intermediate layer” allegedly lacks antecedent basis.

In response, Applicants have amended independent claim 33, from which claim 38 depends, so that claim 33 recites disposing a layer of phosphor on an intermediate layer. Applicants submit that this amendment appropriately addresses the rejection of claim 38. Reconsideration and withdrawal of this rejection are, therefore, respectfully requested.

The 35 U.S.C. § 103(a) Rejections

Claims 1-4, 6-9, 11-15, 17-23, and 25-31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Miller et al. (U.S. Patent No. 6,155,699) in view of Durocher et al. (U.S. Patent No. 6,733,711).

Applicants traverse this rejection and submit that claims 1-4, 6-9, 11-15, 17-23, and 25-31 are *prima facie* obvious in view of the combination of Miller et al. and Durocher et al. because such combination does not teach all of the elements of claims 1-4, 6-9, 11-15, 17-23, and 25-31. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. *See* M.P.E.P. § 2143.

Claim 1 of the present application in part recites a light source that includes an intermediate layer disposed between the LED dies and the phosphor patches. Claim 1 further recites that the intermediate layer has a first side facing the LED dies and a second side facing the couplers. Further, claim 1 recites that the phosphor patches are disposed on the second side of the intermediate layer. For example, FIG. 8 illustrates light source 600 having an intermediate layer 612 that is provided with a number of phosphor patches 614 on one side. *See* Specification (of the patent publication of this application), ¶ 0047. As can also be seen in FIG. 6, the first side of the intermediate layer 612 faces the LED dies 626. In other words, the first side of the intermediate layer faces more than one LED die and the second side of the intermediate layer has more than one phosphor patch provided thereon. As described in the Specification in regard to the embodiment illustrated in FIG. 10, the use of an intermediate layer in a large sheet to cover multiple LEDs avoids the complex process of printing the phosphor material directly on the LEDs themselves, and the need to cut the sheet up into small regions that fit the phosphor patches. *See* Specification at ¶ 0057.

Further, claim 12 of the present application in part recites a light source that includes two or more light emitting diode dies, two or more couplers, and an intermediate layer disposed

between the dies and the couplers. In other words, the intermediate layer is disposed between two or more dies and two or more couplers.

In addition, amended claim 26 in part recites a light source that includes a plurality of LED dies, and an intermediate layer disposed over the dies.

In contrast to independent claims 1, 12, and 26, Miller et al. discloses an LED that preferably includes a dome-shaped distributed Bragg reflector (DBR) mirror (i.e., the alleged intermediate layer) formed on an encapsulating layer that encapsulates the LED die. *See* Miller et al., Abstract. In the most preferred embodiment, the dome-shaped configuration of the DBR mirror is generally hemispheric. *Id.* at column 5, lines 36-38. In other words, the DBR mirror is formed in a dome over the light source. Miller et al. does not describe forming the DBR mirror over more than one light source. Therefore, Miller et al. does not teach that the DBR mirror (i.e., the alleged intermediate layer) is disposed between light sources and phosphor patches as is recited in claim 1 of the present application, disposed between two or more LED dies and two or more respective couplers as is recited in claim 12, or disposed over a plurality of LED dies as is recited in claim 26. As result, Miller et al. does not teach all of the elements of any of claims 1, 12, or 26.

The addition of Durocher et al. does nothing to cure the deficiencies already present in Miller et al. For example, the portion of Durocher et al. relied upon by the Office Action teaches an array of LED light sources on a substrate. *See* Durocher et al., FIGS. 1 and 11. However, combining the light sources of Miller et al. with the array of Durocher et al. still does not produce an embodiment that teaches all of the elements of claims 1, 12, and 26. For example, placing the light sources of Miller et al. in an array would not produce a light source having an intermediate layer disposed between LED dies and phosphor patches as is recited in claim 1 of the present application. As a result, the combination of Miller et al. and Durocher et al. does not teach all of the elements of independent claims 1, 12, or 26.

Claims 2-4, 6-9, 11, 13-15, 17-23, 25, and 26-31, which depend from one of independent claims 1, 12, or 26, are patentable over the combination of Miller et al. and Durocher et al. for the same reasons as presented above for claims 1, 12, and 26. In addition, claims 2-4, 6-9, 11, 13-15, 17-23, 25, and 26-31 each recite additional elements that further support patentability when combined with either claim 1, 12, or 26.

For at least the above reasons, Applicants submit that claims 1-4, 6-9, 11-15, 17-23, and 25-31 are patentable over the combination of Miller et al. and Durocher et al. Reconsideration and withdrawal of this rejection are, therefore, respectfully requested.

Claims 10 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Miller et al. and Durocher et al. as applied to claim 1 above, and further in view of Ota et al. (U.S. Patent No. 6,943,380).

Applicants traverse this rejection and submit that claims 10 and 24 are not *prima facie* obvious in view of the cited references because the combination of such references does not teach all of the elements of claims 10 and 24.

Claim 10, which depends from independent claim 1, and claim 24, which depends from independent claim 12, each include all of the elements of the claims from which they depend. As stated above in regard to the rejections of claims 1 and 12, the combination of Miller et al. and Durocher et al. does not teach all of the elements of claims 1 and 12. The addition of Ota et al. does nothing to cure the deficiencies already present in Miller et al. and Durocher et al. In addition, claims 10 and 24 each recite additional elements that further support patentability when combined with either claim 1 or claim 12.

For at least the above reasons, Applicants submit that claims 10 and 24 are patentable over the cited references. Reconsideration and withdrawal of this rejection are, therefore, respectfully requested.

Claims 5, 16, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Miller et al. and Durocher et al. as applied to claim 1 above, and further in view of Shimizu et al. (U.S. Patent No. 6,949,772).

Applicants traverse this rejection and submit that claims 5, 16, and 32 are not *prima facie* obvious because the combination of cited references does not teach all of the elements of claims 5, 16, and 32. Claim 5, which depends from independent claim 1, claim 16, which ultimately depends from independent claim 12, and claim 32, which ultimately depends from independent claim 26, each recite all of the elements of the claims from which they depend. As stated above for the 35 U.S.C. § 103(a) rejection of claims 1, 12, and 26, the combination of Miller et al. and

Durocher et al. does not teach all of the elements of claims 1, 12, or 26. The addition of Shimizu et al. does nothing to cure the deficiencies already present in Miller et al. and Durocher et al. In addition, claims 5, 16, and 32 each recite additional elements that further support patentability when combined with either independent claim 1, 12, or 26.

For at least the above reasons, Applicants submit that claims 5, 16, and 32 are patentable over the cited references. Reconsideration and withdrawal of this rejection are, therefore, respectfully requested.

Claims 33-39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimizu et al. in view of Miller et al.

Applicants traverse this rejection and submit that claims 33-39 are not *prima facie* obvious in view of the combination of Shimizu et al. and Miller et al. because such combination does not teach all of the elements of claims 33-39. For example, claim 33 recites a method of assembling a light source that includes providing a plurality of LED dies, disposing a layer of phosphor on an intermediate layer, and positioning the intermediate layer and the layer of phosphor over the LED dies.

In contrast to claim 33, the portion of Shimizu et al. relied upon by the Office Action describes forming an LED illumination source that includes mounting LED bare chips 22 to substrate 21. A plate 23 with holes 23a is provided on the substrate 21 (FIG. 1(a)), or a resin layer 24 is provided on the substrate (FIG. 1(b)). In the embodiment in FIG. 1(a), the holes 23a are filled with resin 24. The Office Action alleges that the plate 23 is equivalent to the intermediate layer of claim 33. However, Shimizu et al. does not describe positioning the plate 23 (i.e., the alleged intermediate layer) over the LED dies as is recited in claim 33.

The addition of Miller et al. does nothing to cure this deficiency already present in Shimizu et al. For example, Miller et al. describes a method of fabricating a phosphor-conversion LED that includes depositing a layer of transparent material over a light source (step 44), forming a DBR mirror over the first layer of transparent material (step 46), and depositing a layer of phosphorescent material over the DBR mirror (step 48). *See* Miller et al., column 7, line 63, through column 8, line 25. Miller et al. does not describe positioning an intermediate layer and a layer of phosphor over the LED dies as is recited in claim 33 of the present application.

Instead, the DBR mirror is formed over a single LED, and then a phosphorescent material is deposited over the DBR mirror. Because the combination of Shimizu et al. and Miller et al. does not teach all of the elements of claim 33, such claim is not *prima facie* obvious in view of Shimizu et al. and Miller et al.

Claims 34-39, which depend from claim 33, are patentable over the combination of Shimizu et al. and Miller et al. for the same reasons as presented above for claim 33. In addition, claims 34-39 each recite additional elements that further support patentability when combined with claim 33.

For at least the above reasons, Applicants submit that claims 33-39 are patentable over the combination of Shimizu et al. and Miller et al. Reconsideration and withdrawal of this rejection are, therefore, respectfully requested.

Summary

It is respectfully submitted that the pending claims are in condition for allowance. Reconsideration and withdrawal of all rejections are respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted,

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Date

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